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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/757,791	01/15/2004	Manoj Singhal	15155US01	5464

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EXAMINER

NEWAY, SAMUEL G

ART UNIT	PAPER NUMBER
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2626

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/757,791	Applicant(s) SINGHAL, MANOJ	
	Examiner Samuel G. Neway	Art Unit 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-7,10-13,15-17 and 20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-7,10-13,15-17 and 20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is responsive to the RCE filed on 17 June 2008.
2. Claims 1 – 3, 5 – 7, 10 – 13, 15 – 17, and 20 are pending.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 3, 5, 11, 13, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al (USPN 6,990,443) in view of De Lima Araujo et al ("Formant Frequency Estimation Using a Mel Scale LPC Algorithm", In Proc. of ITS '98, IEEE Intl., Vol. 1, 1998, pp. 207-212).

Claim 1:

Abe discloses a method for classifying an audio signal (Abstract), said method comprising:

calculating a plurality of linear prediction coefficients (LPC) for a portion of the audio signal (FIG. 3, item 13 and related text);

inverse filtering the portion of the audio signal with the plurality of linear prediction coefficients (LPC), thereby resulting in a residual signal (FIG. 3, item 20 and related text);

measuring the residual energy of the residual signal (FIG. 3, items 20, 36, and related text); and

comparing the residual energy to a threshold ("extracting the characteristic quantity of a signal ... and classifying the signal ... according to the characteristic quantity thereof", col. 3, lines 43-51).

Abe does not explicitly disclose decimating the portion of audio, thereby causing the portion to comprise a predetermined number of samples.

In a speech processing method, De Lima Araujo discloses decimating a portion of a speech signal (page 209, col. 1, paragraph 5).

It would have been obvious to one with ordinary skill in the art at the time of the invention to decimate Abe's audio signal thereby causing the portion to comprise a predetermined number of samples in order to reduce fusion errors (De Lima Araujo, page 209, col. 2, paragraph 1).

Claim 3:

Abe and De Lima Araujo disclose the method of claim 1, Abe further discloses wherein the portion of the audio signal comprises a frame (FIG. 2 and related text).

Claim 5:

Abe and De Lima Araujo disclose the method of claim 1, further comprising: spectrally flattening the portion of the audio signal (FIG. 3, item 15 and related text).

Claims 11, 13 and 15:

System claims 11, 13, and 15 and method claims 1, 3, and 5 are related as system and the method of using same, with each claimed element's function

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corresponding to the claimed method step. Accordingly claims 11, 13, and 15 are rejected with the same rationale as applied above with respect to method claims 1, 3, and 5.

5. Claims 2 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al (USPN 6,990,443) in view of De Lima Araujo et al ("Formant Frequency Estimation Using a Mel Scale LPC Algorithm", In Proc. of ITS '98, IEEE Intl., Vol. 1, 1998, pp. 207-212) and in further view of Koishida et al (USPN 6,658,383).

Claim 2:

Abe and De Lima Araujo disclose the method of claim 1, but they do not explicitly disclose classifying the portion of the audio signal as music, if the residual energy exceeds the threshold; and classifying the portion of the audio signal as speech, if the threshold exceeds the residual energy.

In a method, similar to Abe's, of audio classification, Koishida teaches that "linear prediction-based techniques such as CELP can deliver high quality reproduction for speech signals, but yield unacceptable quality for the reproduction of music signals" (col. 1, lines 33-37).

It would have been obvious to one with ordinary skill in the art at the time of the invention to use Abe's residual energy to classify speech and music because as Koishida teaches LPC (linear predictive coding) techniques model speech better than they do music, therefore giving a smaller error (residual energy) for speech signals compared to the error for music signals.

Claim 12:

System claim 12 and method claim 2 are related as system and the method of using same, with each claimed element's function corresponding to the claimed method step. Accordingly claim 12 is rejected with the same rationale as applied above with respect to method claim 2.

6. Claims 6, 10, 16, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al (USPN 6,990,443) in view of Rabiner, L ("Digital Processing of Speech Signals", Prentice-Hall, 1978) and in further view of De Lima Araujo et al ("Formant Frequency Estimation Using a Mel Scale LPC Algorithm", In Proc. of ITS '98, IEEE Intl., Vol. 1, 1998, pp. 207-212).

Claim 6:

Abe discloses a method for classifying an audio signal (Abstract), said method comprising:

taking a discrete Fourier transformation of a portion of the audio signal for a plurality of frequencies (FIG. 3, item 12 and related text);

calculating a plurality of linear prediction coefficients (LPC) for the portion of the signal (FIG. 3, item 13 and related text).

Abe does not explicitly disclose measuring an inverse filter response and a mean squared error as claimed.

In a textbook on speech processing, Rabiner discloses measuring an inverse filter response for said plurality of frequencies with said plurality of linear prediction coefficients (LPC) (page 433, equation 8.102 and related text); and

measuring a mean squared error between the discrete Fourier transformation of the portion of the audio signal for the plurality of frequencies and the inverse filter response (page 433, equation 8.103b and related text);

It would have been obvious to one of ordinary skill in the art at the time of the invention to perform Abe's method in the frequency domain in order to "see peaks at the formant frequencies" (Rabiner, page 433, lines 3-5).

Abe further discloses comparing the means squared error to a threshold ("extracting the characteristic quantity of a signal ... and classifying the signal ... according to the characteristic quantity thereof", col. 3, lines 43-51).

Abe does not explicitly disclose decimating the portion of audio, thereby causing the portion to comprise a predetermined number of samples.

In a speech processing method, De Lima Araujo discloses decimating a portion of a speech signal (page 209, col. 1, paragraph 5).

It would have been obvious to one with ordinary skill in the art at the time of the invention to decimate Abe's audio signal thereby causing the portion to comprise a predetermined number of samples in order to reduce fusion errors (De Lima Araujo, page 209, col. 2, paragraph 1).

Claim 10:

Abe, Rabiner, and De Lima Araujo disclose the method of claim 6, De Lima Araujo further discloses: Spectrally flattening (pre-emphasis) the portion of the audio signal (page 209, col. 2, paragraph 2).

Claims 16 and 20:

System claims 16 and 20 and method claims 6 and 10 are related as system and the method of using same, with each claimed element's function corresponding to the claimed method step. Accordingly claims 16 and 20 are rejected with the same rationale as applied above with respect to method claims 6 and 10.

7. Claims 7 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al (USPN 6,990,443) in view of Rabiner, L ("Digital Processing of Speech Signals", Prentice-Hall, 1978), in view of De Lima Araujo et al ("Formant Frequency Estimation Using a Mel Scale LPC Algorithm", In Proc. of ITS '98, IEEE Intl., Vol. 1, 1998, pp. 207-212), and in further view of Koishida et al (USPN 6,658,383).

Claim 7:

Abe, Rabiner, and De Lima Araujo disclose the method of claim 8, but they do not explicitly disclose: classifying the portion of the audio signal as music, if the mean squared error exceeds the threshold; and classifying the portion of the audio signal as speech, if the threshold exceeds the means squared error energy.

In a method, similar to Abe's, of audio classification, Koishida teaches that "linear prediction-based techniques such as CELP can deliver high quality reproduction for

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speech signals, but yield unacceptable quality for the reproduction of music signals” (col. 1, lines 33-37).

It would have been obvious to one with ordinary skill in the art at the time of the invention to use Abe and Rabiner’s error to classify speech and music because as Koishida teaches LPC (linear predictive coding) techniques model speech better than they do music, therefore giving smaller error for speech signals compared to the error for music signals.

Claim 17:

System claim 17 and method claim 7 are related as system and the method of using same, with each claimed element’s function corresponding to the claimed method step. Accordingly claim 17 is rejected with the same rationale as applied above with respect to method claim 7.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Samuel G. Neway whose telephone number is 571-270-1058. The examiner can normally be reached on Monday - Friday 8:30AM - 5:30PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, David R Hudspeth can be reached on 571-272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R Hudspeth/
Supervisory Patent Examiner, Art Unit 2626

/S. G. N./
Examiner, Art Unit 2626